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U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR

10/030115

INTERNATIONAL APPLICATION NO.  
PCT/JP00/03786INTERNATIONAL FILING DATE  
9 June 2000PRIORITY DATE CLAIMED  
None

TITLE OF INVENTION

EXTERNAL POWER SOURCE CONTROL SYSTEM FOR PORTABLE TELEPHONE

APPLICANT(S) FOR DO/EO/US

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Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (24) indicated below.
4. ☐ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
  - a. ☐ is attached hereto (required only if not communicated by the International Bureau).
  - b. ☒ has been communicated by the International Bureau.
  - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
  - a. ☒ is attached hereto.
  - b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
  - a. ☐ are attached hereto (required only if not communicated by the International Bureau).
  - b. ☐ have been communicated by the International Bureau.
  - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
  - d. ☒ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
10. ☐ An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).
11. ☐ A copy of the International Preliminary Examination Report (PCT/IPEA/409).
12. ☒ A copy of the International Search Report (PCT/ISA/210).

## Items 13 to 20 below concern document(s) or information included:

13. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☐ A **FIRST** preliminary amendment.
16. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
17. ☐ A substitute specification.
18. ☐ A change of power of attorney and/or address letter.
19. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
20. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
21. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
22. ☐ Certificate of Mailing by Express Mail
23. ☒ Other items or information:

Drawings (9 sheets)PCT/IB/308  
Form PTO-1449/Cited Reference (1)

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24. The following fees are submitted:

**BASIC NATIONAL FEE ( 37 CFR 1.492 (a) (1) - (5)) :**

- ☐ Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO . . . . . \$1040.00
- ☒ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO . . . . . \$890.00
- ☐ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO . . . . . \$740.00
- ☐ International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) . . . . . \$710.00
- ☐ International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) . . . . . \$100.00

**ENTER APPROPRIATE BASIC FEE AMOUNT =****CALCULATIONS PTO USE ONLY**

\$890.00

Surcharge of \$130.00 for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (e)).

\$0.00

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE
Total claims	11 - 20 =	0	x \$18.00
Independent claims	2 - 3 =	0	x \$84.00

\$0.00

\$0.00

Multiple Dependent Claims (check if applicable). ☐

\$0.00

**TOTAL OF ABOVE CALCULATIONS =**

\$890.00

☐ Applicant claims small entity status. See 37 CFR 1.27). The fees indicated above are reduced by 1/2.

\$0.00

**SUBTOTAL =**

\$890.00

Processing fee of \$130.00 for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (f)).

\$0.00

**TOTAL NATIONAL FEE =**

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Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) (check if applicable). ☐

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**TOTAL FEES ENCLOSED =**

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Amount to be refunded	\$
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- a. ☒ A check in the amount of \$890.00 to cover the above fees is enclosed.
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- d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit card information should not be included on this form.** Provide credit card information and authorization on PTO-2038.

**NOTE:** Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

Surinder Sachar  
Registration No. 34,423

**22850**

SIGNATURE

Marvin J. Spivak

NAME

24,913

REGISTRATION NUMBER

DATE

Jan 23 2002

9/PRTS

10/030115  
1 531 Rec'd PCT/PTC 23 JAN 2002

EXTERNAL POWER SOURCE CONTROL SYSTEM FOR PORTABLE  
TELEPHONE

TECHNICAL FIELD

5           The present invention relates to an external power source control system for a portable telephone for a public communications network and having a built-in charging function.

10 BACKGROUND ART

Fig. 1 is a block diagram showing a construction of a related-art external power control system for a portable telephone having a built-in charging function. Referring to Fig. 1,  
15 the external power control system comprises a terminal for a rechargeable battery pack 1 (hereinafter, referred to as battery power source) for operating the portable telephone, a terminal for an external power source 2 used to charge the  
20 battery power source 1, a power key 3 of the portable telephone, a charging circuit 4 for charging the battery power source 1 by the external power source 2, a regulator 5 for receiving a voltage of the battery power source 1 or the  
25 external power source 2 at a Vin terminal and outputting a power supply voltage to the circuitry of the portable telephone via a Vout terminal, based on a logic level at an enable terminal (EN terminal), and a controller 10 for controlling the  
30 charging circuit 4 and the regulator 5.

The controller 10 comprises a charging controller 101 for controlling the charging circuit 4, a key detector 102 for detecting the depression of the power key 3, and a power maintaining unit 5 103 for bringing the EN terminal of the regulator 5 to a high level so as to maintain the level of the power supply voltage output from the regulator 5.

A description will now be given of the operation.

10 When only the battery power source 1 is connected to the portable telephone, i.e., when the external power source 2 is not connected to the portable telephone, an input voltage from the battery power source 1 is applied to the Vin 15 terminal of the regulator 5.

In this state, the EN terminal of the regulator 5 is at a low level so that the regulator 5 does not supply the power supply voltage to the circuitry of the portable telephone via the Vout 20 terminal.

When a user of the portable telephone depresses the power key 3, the power supply voltage is supplied to the circuitry of the portable telephone set so that the controller 10 is operated, 25 as a result of the input voltage from the battery power source 1 being applied to the EN terminal of the regulator 5. The key detector 102 of the controller 10 detects the depression of the power key 3 and maintains the output of the power 30 maintaining unit 103 at a high level using register

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access by a CPU (not shown). With this, the EN terminal of the regulator 5 is maintained at a high level. Accordingly, when the user of the portable telephone releases the power key 3, the power source maintaining unit 103 maintains the output of the regulator 5 so that power supply voltage of the portable telephone is prevented from being turned off.

The power supply voltage of the portable telephone is turned off by detecting the depression of the power key 3. The CPU uses a register access to bring the output of the power source maintaining unit 103 to a low level so that the output of the power supply to the circuitry of the portable telephone is turned off.

When the external power source 2 is connected to the portable telephone while the battery power source 1 is connected, the input voltage is applied to the Vin terminal of the regulator 5 and a voltage from the external power source 2 is applied to the EN terminal of the regulator 5. As a result, the power supply voltage is supplied from the Vout terminal of the regulator 5 to the circuitry of the portable telephone so that the controller 10 is operated.

The CPU (not shown) or an electronic circuit of the controller 10 monitors the status of the battery power source 1. By controlling the charging circuit 4 via the charging controller 101, the controller 10 operates to charge the battery power

source 1 from the external power source 2. When the external power source 2 is connected to the portable telephone while the battery power source 1 is not connected, the same operation described above is performed except that the charging control is unnecessary.

In the above-described construction of the related-art external power source control system of the portable telephone, while the external power source 2 continues to supply the power to the portable telephone, the power supply voltage continues to be output via the Vout terminal of the regulator 5. Therefore, it is not possible to turn the power of the portable telephone off even when the power is no longer necessary.

When the portable telephone is used in a vehicle by using a car battery as the external power source 2, exhaustion of the car battery may be invited as a result of an electric current being wasted. When the domestic ac power source is used as the external power source 2, the user may have to incur unnecessary payment of electric bills.

The present invention has been developed in order to resolve the above-mentioned problems and has an objective of realizing an external power source control system designed to turn off, while the external power source 2 remains connected, the power supply voltage: when a charging operation is completed; when overflow of a timer, set to expire when a boost charge is completed so that the power

is forced to be turned off, occurs; when a control program determines that the power need not be turned on; or when the user of the portable telephone determined that the power need not be turned on and performs required actions such as a key input and a speech input, the goals accomplished by the system being the suppression of a wasted electric current of the domestic ac power source, and reduction in electric current consumption.

#### DISCLOSURE OF THE INVENTION

An external power source control system for a portable telephone according to the present invention comprises: a regulator connected at an input thereof to a battery power source or an external power source and controlled to output a power supply voltage; a one-shot pulse generating circuit generating a one-shot pulse when the external power source is connected to the portable telephone; a reset circuit outputting a reset signal when the power supply voltage from the regulator reaches a predetermined threshold level; and a controller causing the regulator to output the power supply voltage, based on the one-shot pulse generated by the one-shot pulse generating circuit, maintaining an output of the power supply voltage from the regulator, based on the one-shot pulse generated by the one-shot pulse generating circuit, and canceling the maintenance of the

output of the power supply voltage from the regulator, based on a predetermined instruction indicating that the power is not necessary.

Accordingly, there is provided an external  
5 power source control system for a portable telephone in which it is possible to turn off the power supply voltage while the external power source remains connected, exhaustion of a car battery is prevented, and waste of an electric  
10 current of the domestic ac power source is reduced.

The controller of the external power source control system for a portable telephone according to the present invention may comprise: a pulse generating circuit generating a pulse, based on the  
15 one-shot pulse generated by the one-shot pulse generating circuit and the reset signal output from the reset circuit; an RS latch having an output thereof set, based on the pulse generated by the pulse generating circuit; an OR circuit causing the  
20 regulator to output the power supply voltage, based on the one-shot pulse generated by the one-shot pulse generating circuit or the output set in the RS latch; and a register generating a pulse for resetting the RS latch when a write access to the  
25 register occurs as a result of the predetermined instruction indicating that the power is not necessary.

An advantage provided by the external power source control system for a portable telephone  
30 according to invention is that it is possible to



turn off the power supply voltage while the external power source remains connected, exhaustion of a car battery is prevented, and waste of an electric current of the domestic ac power source is reduced.

The external power source control system for a portable telephone according to the present invention may further comprise a power key connected to the battery power source and causing the battery power to be output from the regulator, wherein the controller maintains the output of the power supply voltage from the regulator, based on the reset signal output from the reset circuit while the power key is being depressed.

The output of the power supply voltage started by the depression of the power key is maintained automatically by an electronic circuit without resorting to a register access from the CPU.

The controller of the external power source control system for a portable telephone according to the present invention may comprise: a first pulse generating circuit generating a first pulse, based on the one-shot pulse generated by the one-shot pulse generating circuit and the reset signal output from the reset circuit; a second pulse generating circuit generating a second pulse, based on the reset signal output from the reset circuit while the power key is being depressed; a first OR circuit receiving the first pulse generated by the first pulse generating circuit or the second pulse

generated by the second pulse generating circuit,  
and providing one of the first pulse and the second  
pulse at an output of the first OR circuit; an RS  
latch having an output thereof set, based on one of  
5 the first pulse and the second pulse output from  
the first OR circuit; a second OR circuit for  
causing the regulator to output the power supply  
voltage, when one of the one-shot pulse generated  
by the one-shot pulse generating circuit and the  
10 output set in the RS latch occurs; and a register  
generating a pulse for resetting the RS latch when  
a write access to the register occurs as a result  
of a predetermined instruction indicating that the  
power is not necessary.

15 The output of the power supply voltage started  
by the depression of the power key is maintained  
automatically by an electronic circuit without  
resorting to a register access from the CPU.

The controller may cancel the maintenance of  
20 the output of the power supply voltage from the  
regulator when the power supply voltage drops below  
a predetermined threshold level so that the reset  
circuit no longer outputs the reset signal.

Therefore, the portable telephone could be  
25 operated only by the battery power source. When the  
battery voltage drops, the power supply to the  
portable telephone is automatically turned off.

The controller of the external power source  
control system for a portable telephone according  
30 to the present invention may comprise: a pulse

generating circuit generating a pulse, based on the one-shot pulse generated by the one-shot pulse generating circuit and the reset signal output from the reset circuit; an RS latch having an output  
5 thereof set, based on the pulse generated by the pulse generating circuit; a second OR circuit for causing the regulator to output the power supply voltage, when one of the one-shot pulse generated by the one-shot pulse generating circuit and the  
10 output set in the RS latch occurs; a register generating a pulse when a write access to the register occurs as a result of a predetermined instruction indicating that the power is not necessary; and a third OR circuit resetting the RS  
15 latch, based on the pulse generated by the register, and also resetting the RS latch when the power supply voltage output from the regulator drops below a predetermined level so that the reset circuit no longer outputs the reset signal.

20 Therefore, the portable telephone could be operated only by the battery power source. When the battery voltage drops, the power supply to the portable telephone is automatically turned off.

An external power source control system for a  
25 portable telephone according to the present invention comprises: a regulator connected at an input thereof to a battery power source or an external power source and controlled to output a power supply voltage; a first reset circuit  
30 outputting a first reset signal when an input

voltage, input as a result of the battery power source or the external power source being connected to a circuitry of the portable telephone, reaches a predetermined threshold level; a second reset  
5 circuit outputting a second reset signal when the power supply voltage output from the regulator reaches a predetermined threshold level; a clock generating circuit generating a clock when the  
10 battery power source or the external power source is connected to the circuitry of the portable telephone; and a controller causing the regulator to output the power supply voltage, based on the external power source, the reset signal output from the first reset circuit, the clock generated by the  
15 clock generating circuit, maintaining the output of the power supply voltage from the regulator, based on the external power source, the first reset signal output from the first reset circuit, the clock generated by the clock generating circuit,  
20 and canceling the maintenance of the power supply voltage from the regulator, based on a predetermined instruction indicating that the power is not necessary.

Accordingly, there is provided an external  
25 power source control system for a portable telephone in which it is possible to turn off the power supply voltage while the external power source remains connected, exhaustion of a car battery is prevented, and waste of an electric  
30 current of the domestic ac power source is reduced.

The controller of the external power source control system for a portable telephone according to the present invention may comprise: first and second flip-flops having an output thereof reset by the first reset signal output from the first reset circuit, and shifting a logic value of the external power source, based on the clock generated by the clock generating circuit; an AND circuit generating a one-shot pulse, based on the outputs from the first and second flip-flops; a pulse generating circuit generating a pulse, based on the one-shot pulse generated by said AND circuit and the second reset signal output from the second reset circuit; an RS latch having an output thereof set, based on the pulse generated by the pulse generating circuit; an OR circuit causing the regulator to output the power supply voltage, based on the one-shot pulse generated by the AND circuit or the output set in the RS latch; and a register generating a pulse for resetting the RS latch when a write access to the register occurs as a result of a predetermined instruction indicating that the power is not necessary.

Accordingly, there is provided an external power source control system for a portable telephone in which it is possible to turn off the power supply voltage while the external power source remains connected, exhaustion of a car battery is prevented, and waste of an electric current of the domestic ac power source is reduced.

The controller of the external power source controller for a portable telephone according to the present invention may comprise: first, second and third flip-flops having an output thereof reset  
5 by the first reset signal output from the first reset circuit, and shifting a logic value of the external power source, based on the clock generated by the clock generating circuit; an AND circuit generating a one-shot pulse, based on the outputs  
10 from the first, second and third flip-flops; a pulse generating circuit generating a pulse, based on the one-shot pulse generated by said AND circuit and the second reset signal output from the second reset circuit; an RS latch having an output thereof  
15 set, based on the pulse generated by the pulse generating circuit; an OR circuit causing the regulator to output the power supply voltage, based on the one-shot pulse generated by the AND circuit or the output set in the RS latch; and a register  
20 generating a pulse for resetting the RS latch when a write access to the register occurs as a result of a predetermined instruction indicating that the power is not necessary.

Therefore, chattering that may occur when the  
25 external power source is connected to the circuitry of the portable telephone is canceled.

The external power source control system for a portable telephone according to the present invention may further comprise a power key  
30 connected to the battery power source and causing

the battery power to be output from the regulator, wherein the controller maintains the output of the power supply voltage from the regulator, based on the second reset signal output from the second  
 5 reset circuit while the power key is being depressed.

Therefore, the output of the power supply voltage started by the depression of the power key is maintained automatically by an electronic  
 10 circuit without resorting to a register access from the CPU.

The controller of the external power source control system for a portable telephone according to the present invention may cancel the maintenance  
 15 of the output of the power supply voltage from the regulator when the power supply voltage drops below a predetermined threshold level so that the second reset circuit no longer outputs the second reset signal.

20 Therefore, the portable telephone could be operated only by the battery power source. When the battery voltage drops, the power supply to the portable telephone is automatically turned off.

## 25 BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a block diagram showing a construction of a related-art external power source control system for a portable telephone;

Fig. 2 is a block diagram showing a  
 30 construction of an external power source control

system for a portable telephone according to a first embodiment;

Fig. 3 is a timing chart showing an operation of the external power source control system for a portable telephone according to the first embodiment;

Fig. 4 is a block diagram showing a construction of an external power source control system for a portable telephone according to a second embodiment;

Fig. 5 is a timing chart showing an operation of the external power source control system for a portable telephone according to the second embodiment;

Fig. 6 is a block diagram showing a construction of an external power source control system for a portable telephone according to a third embodiment;

Fig. 7 is a timing chart showing an operation of the external power source control system for a portable telephone according to the third embodiment;

Fig. 8 is a block diagram showing a construction of an external power source control system for a portable telephone according to a fourth embodiment; and

Fig. 9 is a block diagram showing a construction of an external power source control system for a portable telephone according to a fifth embodiment.



## BEST MODE FOR CARRYING OUT THE INVENTION

A detailed description of the invention will be given by describing the best mode for carrying out invention with reference to the attached  
5 drawings.

## First embodiment

Fig. 2 is a block diagram showing a construction of an external power source control system for a portable telephone according to a  
10 second embodiment. Referring to Fig. 2, the external power source control system comprises, in a similar configuration as the related art, a battery power source 1, an external power source 2, a power key 3, a charging circuit 4, a regulator 5,  
15 a charging controller 101, a key detector 102, and a power maintaining unit 103.

Reference numeral 6 indicates a one-shot pulse generating circuit for generating a one-shot pulse to the controller 10 when the external power source  
20 2 is connected to the portable telephone, 7 indicates a reset circuit (second reset circuit) for generating a reset signal (second reset signal) at a high level when the output of the power supply voltage from the regulator 5 reaches a threshold  
25 level. The reset circuit 7 may be implemented by a reset IC. Alternatively, an input buffer (not shown) of the controller 10 may be implemented by a Schmidt trigger so that power-on reset is performed.

The controller 10 comprises: a pulse  
30 generating circuit 104 (first pulse generating

circuit) for generating a pulse (first pulse) when detecting a rising edge of the reset signal from the reset circuit 7 while the one-shot pulse from the one-shot pulse generating circuit 6 is at a high level; an RS latch 105 for setting an output thereof at a high level upon receiving the pulse from the pulse generating circuit 104; a register 106 for generating a pulse for resetting the RS latch 105 when a CPU (not shown) in the controller 10 performs a write access to the register 106; and an OR circuit 107 (second OR circuit) for generating a high-level output signal when the one-shot pulse from the one-shot pulse generating circuit 6 or the high-level signal from the RS latch 105 is received.

A description will now be given of the operation.

Fig. 3 is a timing chart showing an operation of the external power source control system for a portable telephone according to the first embodiment. When the external power source 2 is connected to the portable telephone while the portable telephone is connected to the battery power source 1, the one-shot pulse generating circuit 6 generates an external power source one-shot pulse at a high level. When the power supply voltage, output via the Vout terminal of the regulator 5 while the one-shot pulse remains at a high level, reaches a threshold level, the reset signal at a high level is generated by the reset

circuit 7 so that a reset cancellation pulse is generated by the pulse generating circuit 104. The reset cancellation pulse causes the output of the RS latch 105 to be set at a high level. Even when  
5 the external power source one-shot pulse from the one-shot pulse generating circuit goes low, the EN terminal of the regulator 5 is maintained at a high level so that the power supply voltage from the Vout terminal is maintained.

10 A description will now be given of how the power supply voltage is turned off while the external power source 2 remains connected. Given that the external power source one-shot pulse from the one-shot pulse generating circuit 6 is at a low  
15 level, the CPU (not shown) in the controller 10 performs a write access to the register 106 when the control program determines that the power need not be turned on as a result of the completion of the charging operation or a timer overflow. The CPU  
20 also accesses the register 106 when the user of the portable telephone determines that the power need not be turned on and performs a certain action such as a key input and a speech input. A register pulse generated as a result of the CPU access causes the  
25 output of the RS latch to be cleared so that the EN terminal of the regulator 5 is brought to a low level and the power supply voltage is turned off.

The foregoing description assumes that the external power source 2 is connected while the  
30 battery power source 1 is connected to the portable

telephone. A similar operation is performed when the external power source 2 is connected while the battery power source 1 is not connected.

Thus, the first embodiment brings into reality  
5 an external power source control system for a portable telephone in which it is possible to turn off the power supply voltage while the external power source 2 remains connected, exhaustion of a car battery is prevented, and waste of an electric  
10 current of the domestic ac power source is reduced.

#### Second embodiment

Fig. 4 is a block diagram showing a construction of an external power source control  
15 system for a portable telephone according to a second embodiment. Those components of the system according to the second embodiment that are identical to the corresponding components of the first embodiment shown in Fig. 2 are designated by  
20 the same reference numerals and the description thereof is omitted. Referring to Fig. 4, numeral 8 indicates a clock generating circuit for generating a clock when the battery power source 1 or the external power source 2 is connected to the  
25 portable telephone, 9 indicates a reset circuit (first reset circuit) for generating a reset signal (first reset signal) when a voltage input thereto reaches a threshold level as a result of the battery power source 1 or the external power source  
30 2 being connected to the portable telephone. The

reset circuit 9 may be implemented by a reset IC. Alternatively, an input buffer (not shown) of the controller 10 may be implemented by a Schmidt trigger so that power-on reset is performed.

5       The controller 100 comprises flip-flops (first flip-flop and second flip-flop) 108 and 109 for shifting a logic value of the external power source 2 in synchronization with the clock from the clock generating circuit 8 when the external power source 10 2 is connected to the portable telephone. The two flip-flops 108 and 109 constitute a shift register. Reference numeral 110 indicates an AND circuit for generating a one-shot pulse depending on logic values of the flip-flops 108 and 109.

15       The clock generating circuit 8 includes a frequency-divider (not shown) for obtaining a suitable period of sampling effected by the flip-flops 108 and 109.

20       A description will now be given of the operation.

Fig. 5 is a timing chart showing an operation of the external power source control system for a portable telephone according to the second embodiment. When the battery power source 1 is 25 connected to the portable telephone, the reset circuit 9 operates so that the reset signal resets the outputs of the flip-flops 108 and 109. In this state, the clock generating circuit 8 has started supplying the clock to the flip-flops 108 30 and 109.

When the external power source 2 is connected, the signal of the external power source 2 input to the flip-flop 108 is sampled in synchronization with the clock from the clock generating circuit 8.

5 When the flip-flop 108 outputs a high level and the flip-flop 109 outputs a low level, the AND circuit 110 outputs a high level. The subsequent operation conducive to the maintaining of the power supply voltage output from the regulator 5 is the same as

10 that of the first embodiment.

Sampling by the next clock generated by the clock generating circuit 8 causes the flip-flops 108 and 109 to output a high level, causing the output of the AND circuit 110 to go low. In a

15 similar configuration as the first embodiment, the power supply voltage may be turned off while the external power source 2 remains connected by the CPU (not shown) in the controller 10 performing a write access to the register 106.

20 The foregoing description assumes that the external power source 2 is connected while the battery power source 1 is connected to the portable telephone. A similar operation is performed when the external power source 2 is connected while the

25 battery power source 1 is not connected.

Thus, the second embodiment brings into reality an external power source control system for a portable telephone in which it is possible to turn off the power supply voltage while the

30 external power source 2 remains connected,

exhaustion of a car battery is prevented, and waste of an electric current of the domestic ac power source is reduced.

5 Third embodiment

Fig. 6 is a block diagram showing a construction of an external power source control system for a portable telephone according to a third embodiment. Those components of the system according to the third embodiment that are identical to the corresponding components of the second embodiment shown in Fig. 4 are designated by the same reference numerals and the description thereof is omitted. Referring to Fig. 6, the controller 10 comprises a flip-flop (third flip-flop) 111 operating in combination with the flip-flops 108 and 109 to shift a logic value of the external power source 2 in synchronization with the clock from the clock generating circuit 8 when the external power source 2 is connected to the portable telephone. The three flip-flops 108, 109 and 111 constitute a shift register. Reference numeral 112 indicates an AND circuit for generating a one-shot pulse depending on the logic values from the flip-flops 108, 109 and 110.

The third embodiment is adapted for cancellation of chattering that may occur when the external power source 2, using three flip-flops. For the purpose of improving the chattering cancellation performance, a shift register

constituted by four or more flip-flops may be used.

A description will now be given of the operation.

Fig. 7 is a timing chart showing an operation  
5 of the external power source control system for a portable telephone according to the third embodiment. In contrast to the second embodiment, where the power supply voltage is turned on immediately after the flip-flop 108 outputs a high  
10 level and the flip-flop 109 outputs a low level, the output of the power supply voltage is deferred according to the third embodiment until the flip-flop 108 outputs a high level, the flip-flop 109 outputs a high level and the flip-flop 111 outputs  
15 a low level, i.e. until two clocks from the clock generating circuit 108 are successively detected. With this, chattering caused by connection of the external power source 2 is cancelled. The other aspects of the third embodiment are the same as the  
20 corresponding aspects according to the second embodiment.

Thus, the third embodiment brings into reality an external power source control system for a portable telephone in which it is possible to turn  
25 off the power supply voltage while the external power source 2 remains connected, exhaustion of a car battery is prevented, and waste of an electric current of the domestic ac power source is reduced.

30 Fourth embodiment



Fig. 8 is a block diagram showing a construction of an external power source control system for a portable telephone according to a fourth embodiment. Those components of the system according to the fourth embodiment that are identical to the corresponding components of the first embodiment shown in Fig. 2 are designated by the same reference numerals and the description thereof is omitted. Referring to Fig. 8, the controller 10 comprises a pulse generating circuit 113 for outputting a pulse (second pulse) when a rising edge of the reset signal from the reset circuit 7 is detected while the power key 3 is maintained in an on state. The controller 10 further comprises an OR circuit (first OR circuit) 114 forwarding the output from the pulse generating circuit 104 or the output from the pulse generating circuit 113 to the RS latch 105.

The pulse generating circuit 113 may output a pulse immediately following an input of the reset signal from the reset circuit 7. Alternatively, a certain delay time may be introduced so as to prevent the portable telephone from being turned on by depressing the power key 3 for only a short period of time.

In the fourth embodiment, the pulse generating circuit 113 and the OR circuit 114 are introduced in addition to the construction according to the first embodiment shown in Fig. 2. Alternatively, the pulse generating circuit 113 and the OR circuit

114 may be introduced in the construction according to the second embodiment shown in Fig. 4 or the construction according to the third embodiment shown in Fig. 6.

5           With this construction, the power supply from the battery power source 1 is maintained in a similar configuration as the external power source 2. That is, the output of the power supply voltage started by the depression of the power key 3 is  
10 maintained automatically by an electronic circuit without resorting to a register access from the CPU. The only requirement for turning-off of the power of the portable telephone is to provide the register 106.

15           The same description as given in the first embodiment applies to the operation of maintaining the output of the power supply voltage when the external power supply 2 is connected and the operation of turning the output of the power supply  
20 off while the external power source 2 remains connected.

          Thus, the fourth embodiment brings into reality an external power source control system for a portable telephone in which it is possible to  
25 turn off the power supply voltage while the external power source 2 remains connected, exhaustion of a car battery is prevented, and waste of an electric current of the domestic ac power source is reduced. Additional advantages are that  
30 the output of the power supply voltage started by

the depression of the power key 3 is maintained automatically by an electronic circuit without resorting to a register access from the CPU.

5 Fifth embodiment

Fig. 9 is a block diagram showing a construction of an external power source control system for a portable telephone according to a fifth embodiment. Those components of the system according to the fifth embodiment that are identical to the corresponding components of the first embodiment shown in Fig. 2 are designated by the same reference numerals and the description thereof is omitted. Referring to Fig. 9, the controller 10 comprises an OR circuit 115 (third OR circuit) receiving a signal from the register 106 occurring as a result of a register write operation, and the reset signal from the reset circuit 7. The OR circuit 115 outputs a signal for resetting the RS latch 105 depending on the inputs.

In the fifth embodiment, the OR circuit 115 is added to the construction according to the first embodiment shown in Fig. 2. Alternatively, the OR circuit 115 may be added to the construction according to the second embodiment shown in Fig. 4 and the construction according to the third embodiment shown in Fig. 6.

With this construction, when the battery voltage drops while the portable telephone is being operated only by the battery power source 1, the

output of the reset circuit 7 goes low so that the output of the RS latch is cleared. Thus, the output of the power supply voltage of the portable telephone is automatically turned off without a  
5 write access from the CPU to the register 106.

The same description as given in the first embodiment applies to the operation of maintaining the output of the power supply voltage when the external power supply 2 is connected and the  
10 operation of turning the output of the power supply off while the external power source 2 remains connected.

Thus, the fifth embodiment brings into reality an external power source control system for a  
15 portable telephone in which it is possible to turn off the power supply voltage while the external power source 2 remains connected, exhaustion of a car battery is prevented, and waste of an electric current of the domestic ac power source is reduced.

20

#### INDUSTRIAL APPLICABILITY

As described above, the external power source control system according to the present invention is adapted for turning off the output of the power  
25 supply voltage of the portable telephone while the external power source 2 remains connected.

## CLAIMS

1. An external power source control system for a portable telephone comprising:

5 a regulator connected at an input thereof to a battery power source or an external power source and controlled to output a power supply voltage;

a one-shot pulse generating circuit generating a one-shot pulse when the external power source is  
10 connected to the portable telephone;

a reset circuit outputting a reset signal when the power supply voltage from said regulator reaches a predetermined threshold level; and

a controller causing said regulator to output  
15 the power supply voltage, based on the one-shot pulse generated by said one-shot pulse generating circuit, maintaining an output of the power supply voltage from said regulator, based on the one-shot pulse generated by said one-shot pulse generating  
20 circuit, and canceling the maintenance of the output of the power supply voltage from said regulator, based on a predetermined instruction indicating that the power is not necessary.

25 2. The external power source control system for a portable telephone according to claim 1, wherein said controller comprises:

a pulse generating circuit generating a pulse, based on the one-shot pulse generated by said one-  
30 shot pulse generating circuit and the reset signal

output from said reset circuit;

an RS latch having an output thereof set,  
based on the pulse generated by said pulse  
generating circuit;

5 an OR circuit causing said regulator to output  
the power supply voltage, based on the one-shot  
pulse generated by said one-shot pulse generating  
circuit or the output set in the RS latch; and

a register generating a pulse for resetting  
10 the RS latch when a write access to said register  
occurs as a result of the predetermined instruction  
indicating that the power is not necessary.

3. The external power source control system  
15 for a portable telephone according to claim 1,  
further comprising a power key connected to the  
battery power source and causing the battery power  
to be output from said regulator, wherein

said controller maintains the output of the  
20 power supply voltage from said regulator, based on  
the reset signal output from said reset circuit  
while the power key is being depressed.

4. The external power source control system  
25 for a portable telephone according to claim 3,  
wherein said controller comprises:

a first pulse generating circuit generating a  
first pulse, based on the one-shot pulse generated  
by said one-shot pulse generating circuit and the  
30 reset signal output from said reset circuit;

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a second pulse generating circuit generating a second pulse, based on the reset signal output from said reset circuit while the power key is being depressed;

5 a first OR circuit receiving the first pulse generated by said first pulse generating circuit or the second pulse generated by said second pulse generating circuit, and providing one of the first pulse and the second pulse at an output of said  
10 first OR circuit;

an RS latch having an output thereof set, based on one of the first pulse and the second pulse output from said first OR circuit;

15 a second OR circuit for causing said regulator to output the power supply voltage, when one of the one-shot pulse generated by said one-shot pulse generating circuit and the output set in the RS latch occurs; and

20 a register generating a pulse for resetting the RS latch when a write access to said register occurs as a result of a predetermined instruction indicating that the power is not necessary.

25 5. The external power source control system for a portable telephone according to claim 1, wherein

said controller cancels the maintenance of the output of the power supply voltage from said regulator when the power supply voltage drops below  
30 a predetermined threshold level so that said reset

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circuit no longer outputs the reset signal.

6. The external power source control system for a portable telephone according to claim 5,

5 wherein said controller comprises:

a pulse generating circuit generating a pulse, based on the one-shot pulse generated by said one-shot pulse generating circuit and the reset signal output from said reset circuit;

10 an RS latch having an output thereof set, based on the pulse generated by said pulse generating circuit;

a second OR circuit for causing said regulator to output the power supply voltage, when one of the  
15 one-shot pulse generated by said one-shot pulse generating circuit and the output set in the RS latch occurs;

a register generating a pulse when a write access to said register occurs as a result of a  
20 predetermined instruction indicating that the power is not necessary; and

a third OR circuit resetting the RS latch, based on the pulse generated by said register, and also resetting said RS latch when the power supply  
25 voltage output from said regulator drops below a predetermined level so that said reset circuit no longer outputs the reset signal.

7. An external power source control system for  
30 a portable telephone, comprising:



a regulator connected at an input thereof to a battery power source or an external power source and controlled to output a power supply voltage;

a first reset circuit outputting a first reset  
5 signal when an input voltage, input as a result of the battery power source or the external power source being connected to a circuitry of the portable telephone, reaches a predetermined threshold level;

10 a second reset circuit outputting a second reset signal when the power supply voltage output from said regulator reaches a predetermined threshold level;

a clock generating circuit generating a clock  
15 when the battery power source or the external power source is connected to the circuitry of the portable telephone; and

a controller causing said regulator to output the power supply voltage, based on the external  
20 power source, the reset signal output from said first reset circuit, the clock generated by said clock generating circuit, maintaining the output of the power supply voltage from said regulator, based on the external power source, the first reset  
25 signal output from said first reset circuit, the clock generated by said clock generating circuit, and canceling the maintenance of the power supply voltage from said regulator, based on a predetermined instruction indicating that the power  
30 is not necessary.

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8. The external power source control system for a portable telephone according to claim 7, wherein said controller comprises:

first and second flip-flops having an output  
5 thereof reset by the first reset signal output from said first reset circuit, and shifting a logic value of the external power source, based on the clock generated by said clock generating circuit;

an AND circuit generating a one-shot pulse,  
10 based on the outputs from said first and second flip-flops;

a pulse generating circuit generating a pulse, based on the one-shot pulse generated by said AND circuit and the second reset signal output from  
15 said second reset circuit;

an RS latch having an output thereof set, based on the pulse generated by said pulse generating circuit;

an OR circuit causing said regulator to output  
20 the power supply voltage, based on the one-shot pulse generated by said AND circuit or the output set in the RS latch; and

a register generating a pulse for resetting the RS latch when a write access to said register  
25 occurs as a result of a predetermined instruction indicating that the power is not necessary.

9. The external power source control system for a portable telephone according to claim 7,  
30 wherein said controller comprises:

first, second and third flip-flops having an output thereof reset by the first reset signal output from said first reset circuit, and shifting a logic value of the external power source, based  
 5 on the clock generated by said clock generating circuit;

an AND circuit generating a one-shot pulse, based on the outputs from said first, second and third flip-flops;

10 a pulse generating circuit generating a pulse, based on the one-shot pulse generated by said AND circuit and the second reset signal output from said second reset circuit;

an RS latch having an output thereof set, based on the pulse generated by said pulse  
 15 generating circuit;

an OR circuit causing said regulator to output the power supply voltage, based on the one-shot pulse generated by said AND circuit or the output  
 20 set in the RS latch; and

a register generating a pulse for resetting the RS latch when a write access to said register occurs as a result of a predetermined instruction indicating that the power is not necessary.

25

10. The external power source control system for a portable telephone according to claim 7, further comprising a power key connected to the battery power source and causing the battery power  
 30 to be output from said regulator, wherein

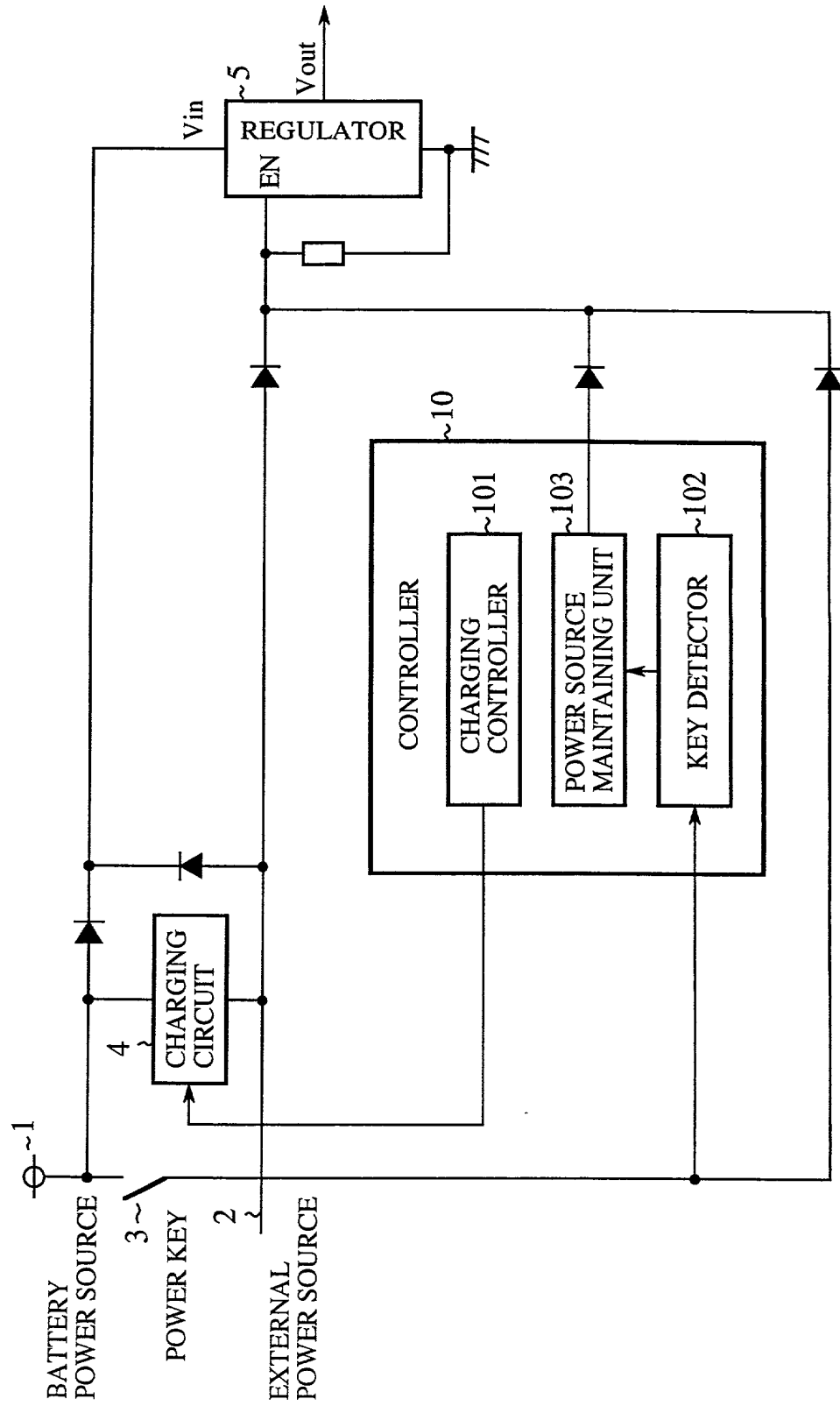
said controller maintains the output of the power supply voltage from said regulator, based on the second reset signal output from said second reset circuit while the power key is being  
5 depressed.

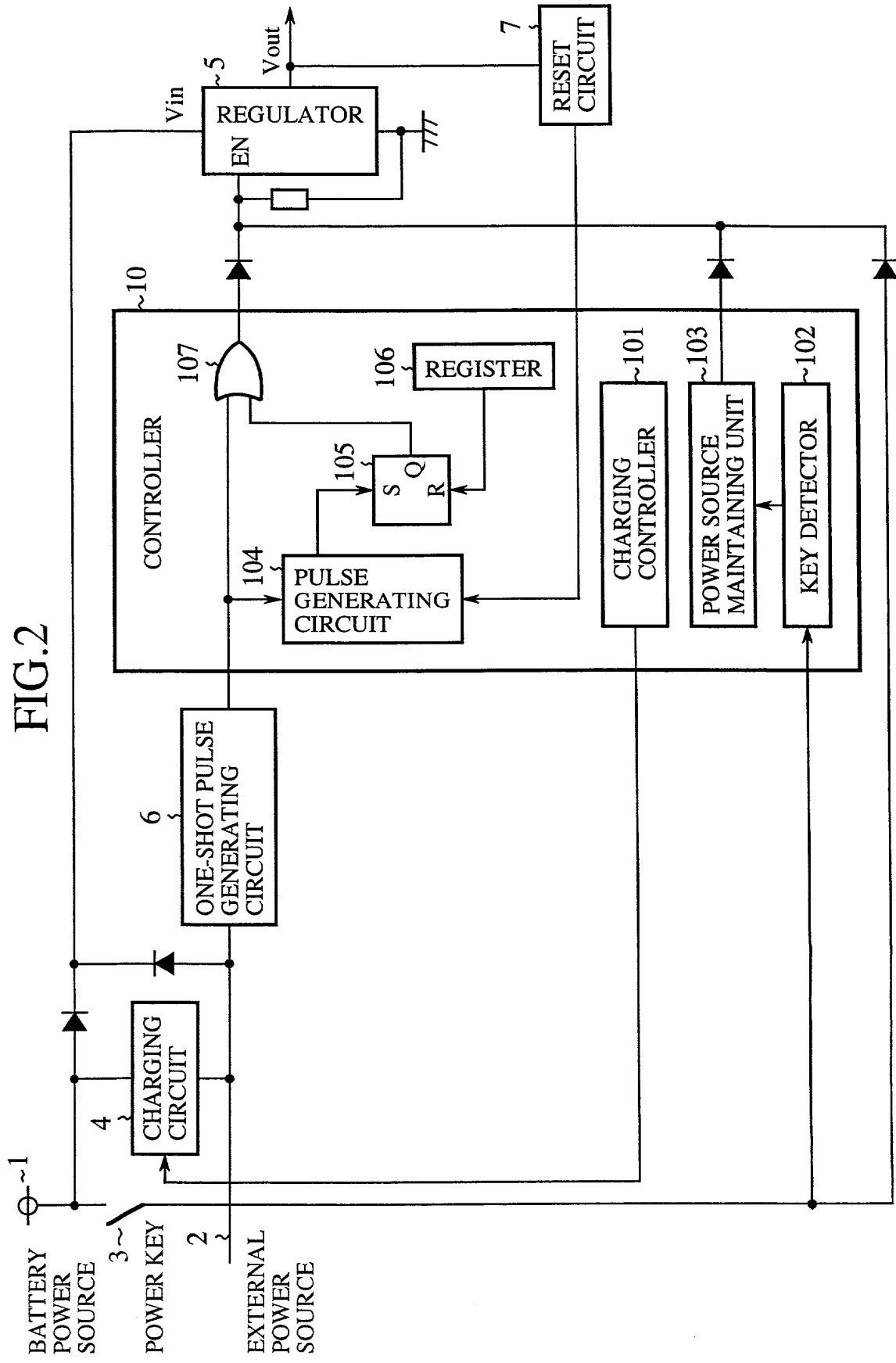
11. The external power source control system for a portable telephone according to claim 7, wherein  
10 said controller cancels the maintenance of the output of the power supply voltage from said regulator when the power supply voltage drops below a predetermined threshold level so that said second reset circuit no longer outputs the second reset  
15 signal.

## ABSTRACT

An external power source control system for a portable telephone includes: a regulator 5 connected at an input thereof to a battery power source 1 or an external power source 2 and outputting a power supply voltage; a one-shot pulse generating circuit 6 generating a one-shot pulse when the external power source 2 is connected to the portable telephone; a reset circuit 7 outputting a reset signal when the power supply voltage reaches a predetermined threshold level; and a controller maintaining an output of the power supply voltage from said regulator 5, based on the one-shot pulse, and canceling the maintenance of the output of the power supply voltage from said regulator 5, based on a predetermined instruction indicating that the power is not necessary.

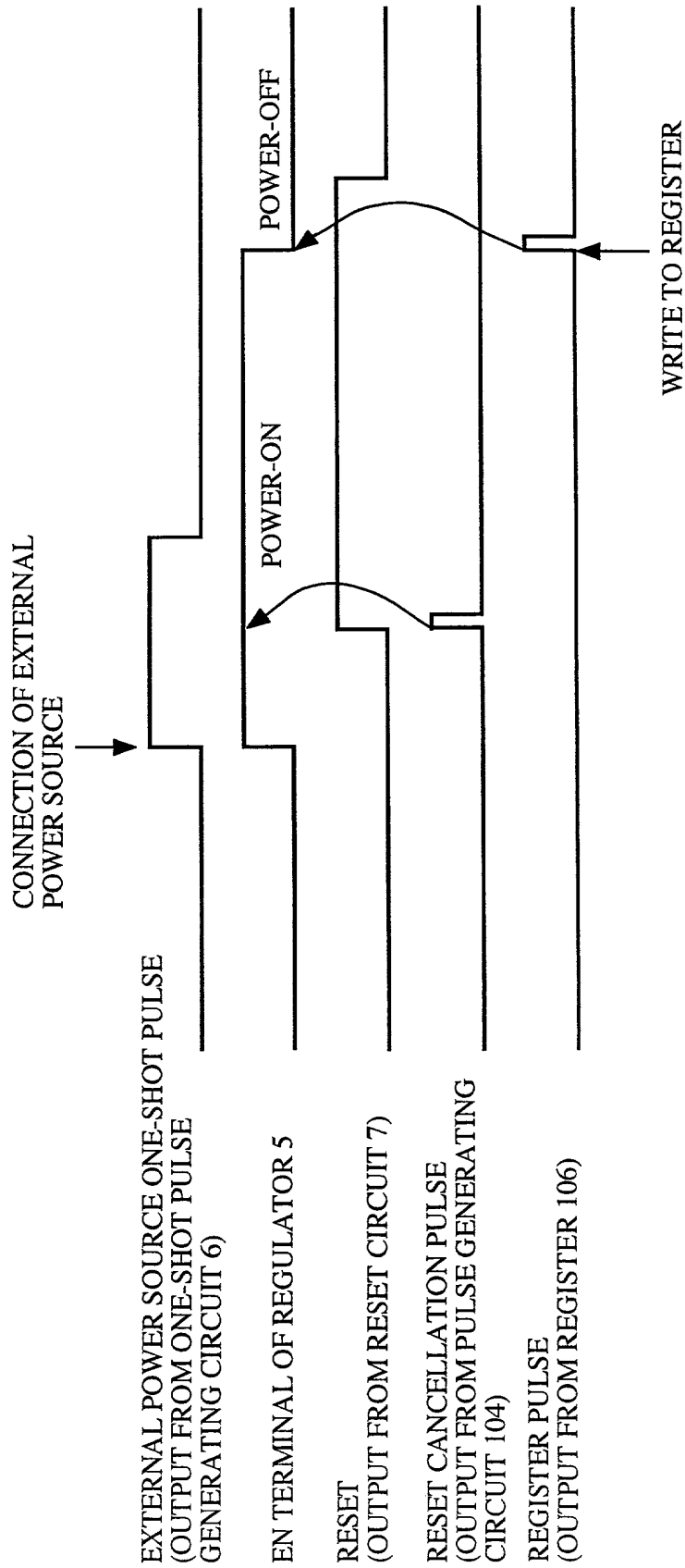
FIG. 1





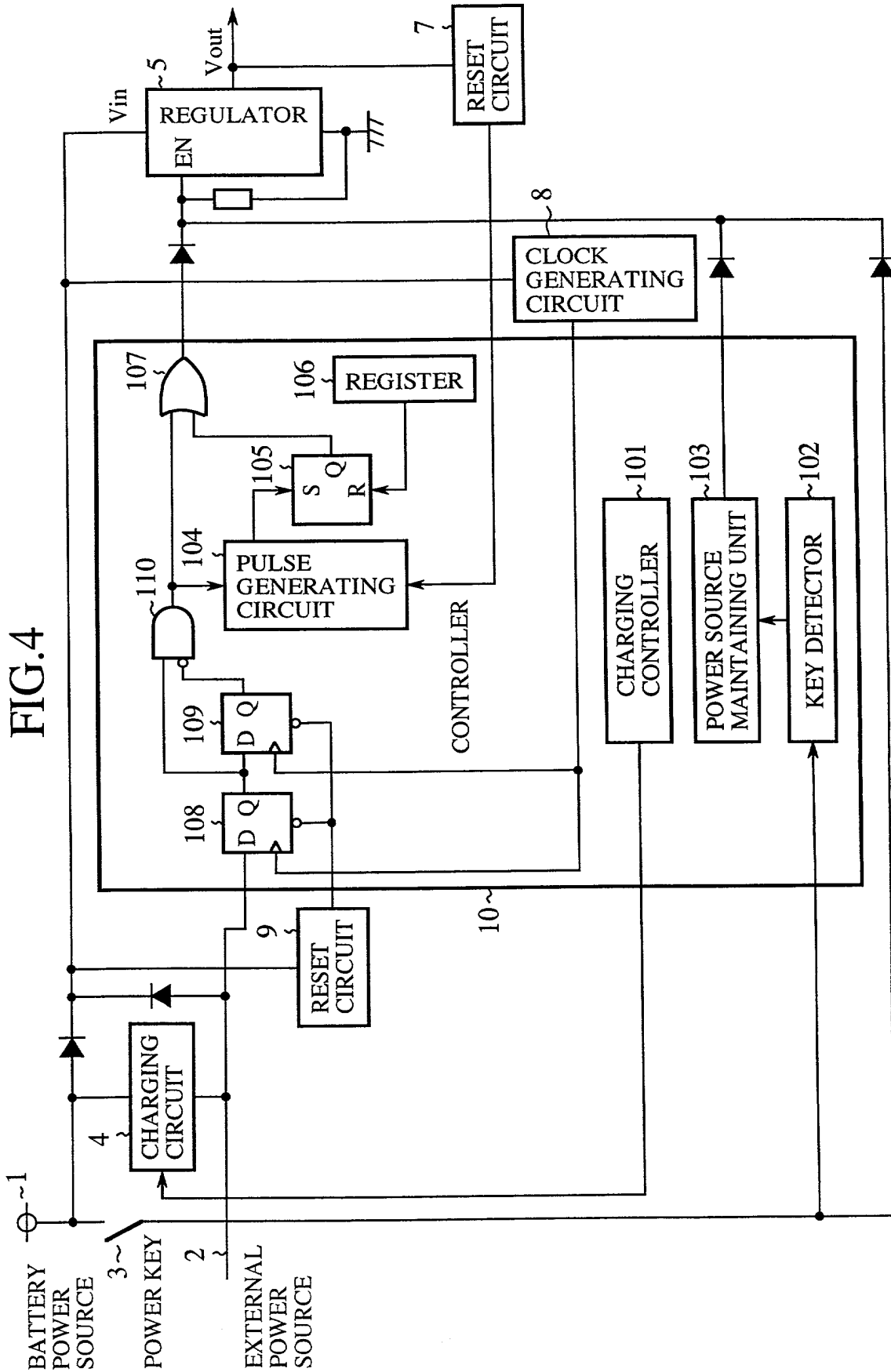
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FIG.3





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FIG.5

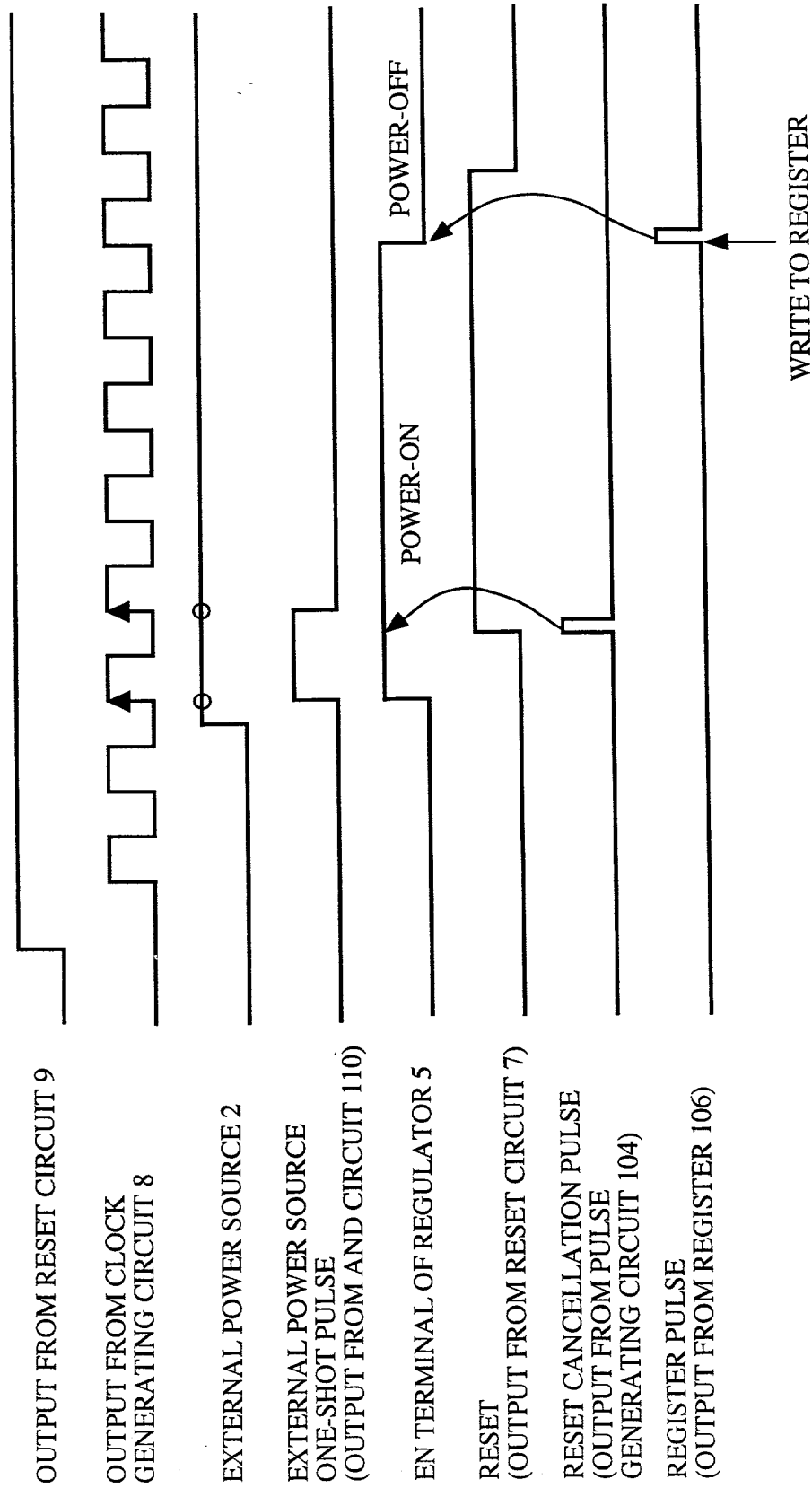


FIG. 6

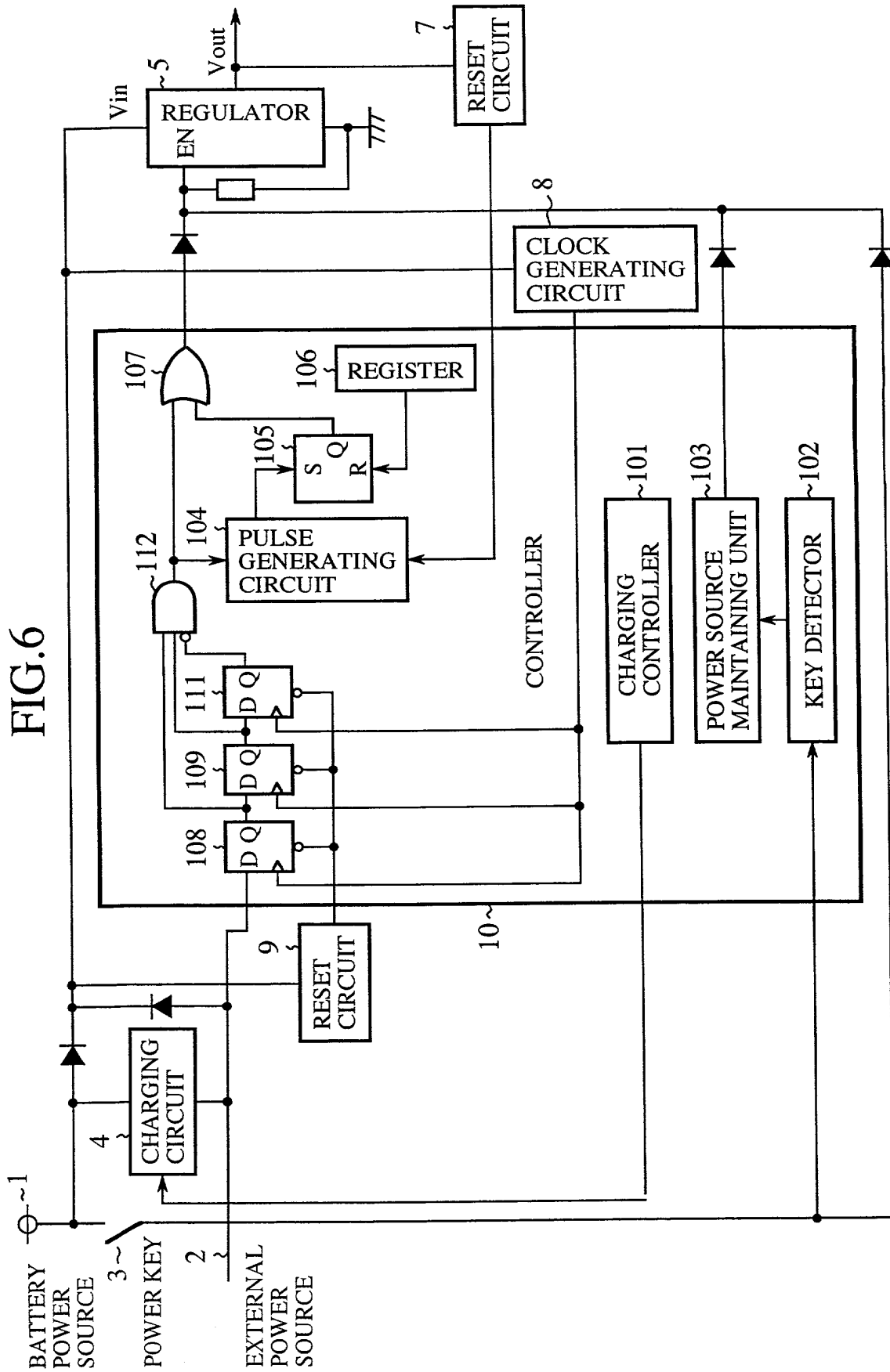
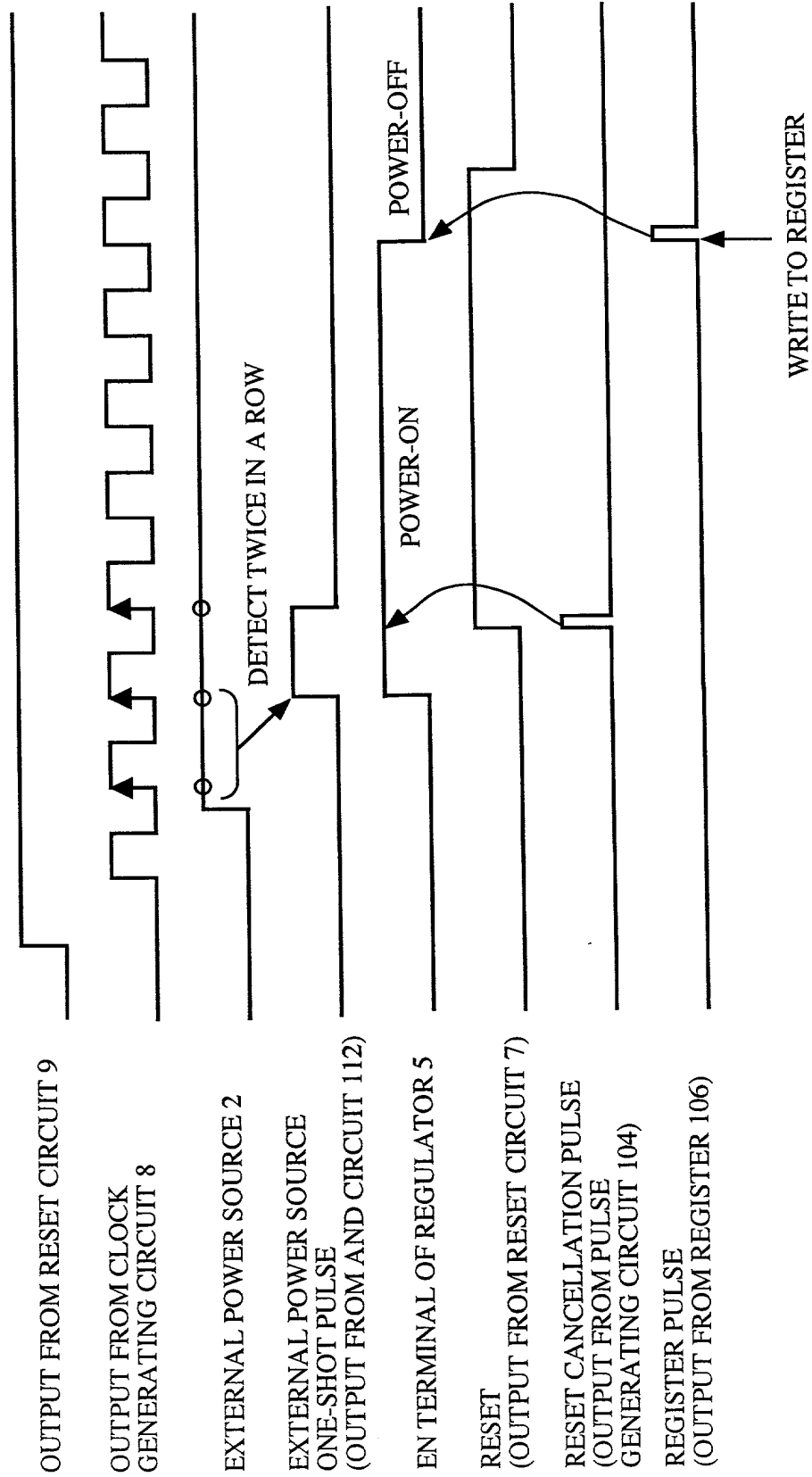
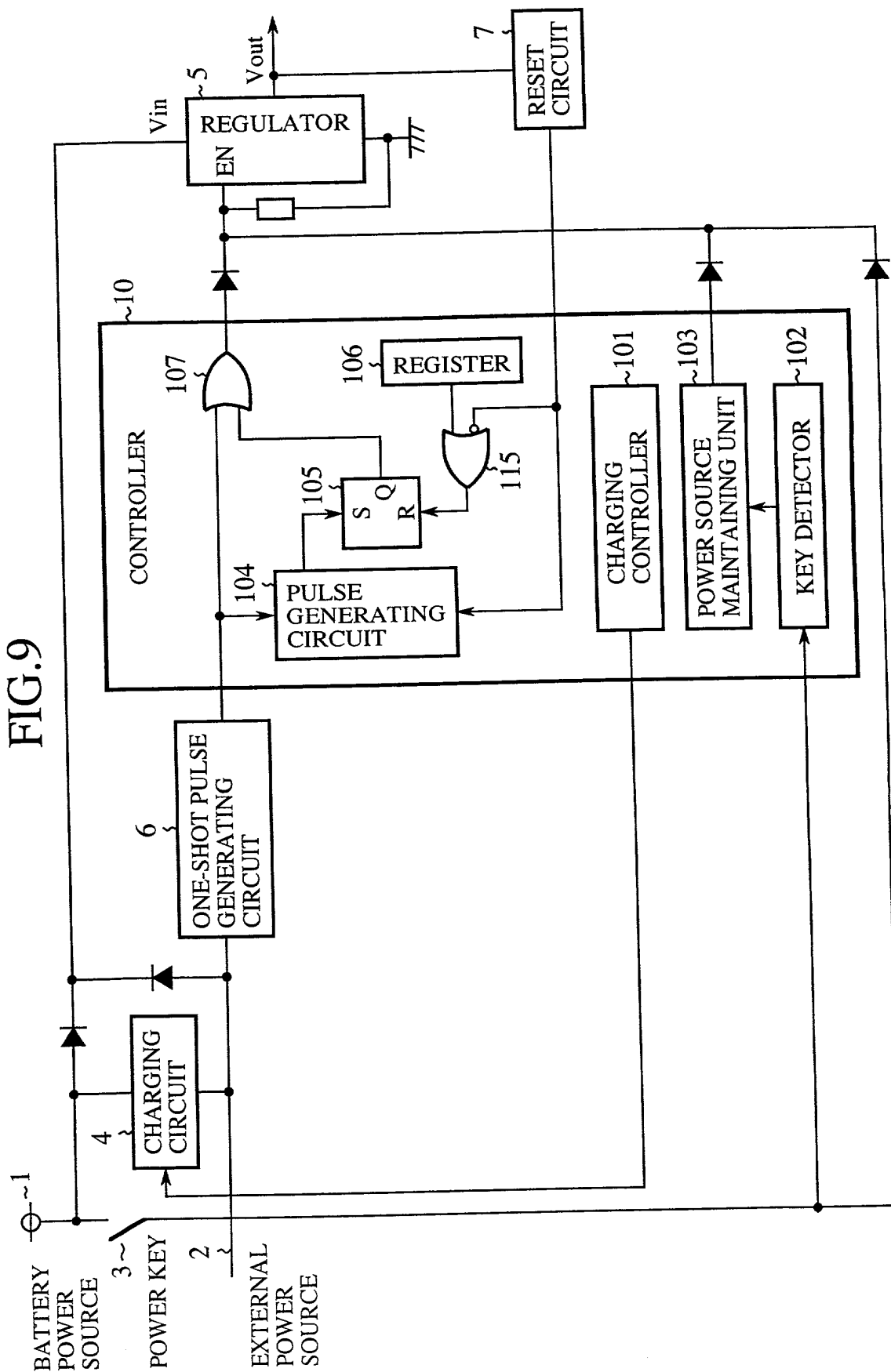


FIG.7





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# Declaration and Power of Attorney For Patent Application

## 特許出願宣言書及び委任状

### Japanese Language Declaration

#### 日本語宣言書

下記の氏名の発明者として、私は以下の通り宣言します。

As a below named inventor, I hereby declare that:

私の住所、私書箱、国籍は下記の私の氏名の後に記載された通りです。

My residence, post office address and citizenship are as stated next to my name.

下記の名称の発明に関して請求範囲に記載され、特許出願している発明内容について、私が最初かつ唯一の発明者（下記の氏名が一つの場合）もしくは最初かつ共同発明者（下記の名称が複数の場合）であると信じています。

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled.

"EXTERNAL POWER SOURCE CONTROL SYSTEM FOR  
PORTABLE TELEPHONE"

上記発明の明細書は、

the specification of which

- ☐ 本書に添付されています。
- ☐ \_\_\_\_月\_\_\_\_日に提出され、米国出願番号または特許協定条約国際出願番号を\_\_\_\_とし、  
(該当する場合) \_\_\_\_に訂正されました。

- ☐ is attached hereto.
- ☒ was filed on June 9, 2000  
as United States Application Number or  
PCT International Application Number  
PCT/JP00/03786 and was amended on  
\_\_\_\_ (if applicable).

私は、特許請求範囲を含む上記訂正後の明細書を検討し、内容を理解していることをここに表明します。

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

私は、連邦規則法典第37編第1条56項に定義されるとおり、特許資格の有無について重要な情報を開示する義務があることを認めます。

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

# Japanese Language Declaration

(日本語宣言書)

私は、米国法典第35編119条 (a) - (d) 項又は365条 (b) 項に基づき下記の、米国以外の国の少なくとも一カ国を指定している特許協力条約365 (a) 項に基づく国際出願、又は外国での特許出願もしくは発明者証の出願についての外国優先権をここに主張するとともに、優先権を主張している、本出願の前に出願された特許または発明者証の外国出願を以下に、枠内をマークすることで、示しています。

Prior Foreign Application(s)  
外国での先行出願

(Number) (番号)	(Country) (国名)
(Number) (番号)	(Country) (国名)

私は、第35編米国法典119条 (e) 項に基づいて下記の米国特許出願規定に記載された権利をここに主張いたします。

(Application No.) (出願番号)	(Filing Date) (出願日)
-----------------------------	------------------------

私は、下記の米国法典第35編120条に基づいて下記の米国特許出願に記載された権利、又は米国を指定している特許協力条約365条 (c) に基づく権利をここに主張します。また、本出願の各請求範囲の内容が米国法典第35編112条第1項又は特許協力条約で規定された方法で先行する米国特許出願に開示されていない限り、その先行米国出願書提出日以降で本出願書の日本国内または特許協力条約国際提出日までの期間中に入手された、連邦規則法典第37編1条56項で定義された特許資格の有無に関する重要な情報について開示義務があることを認識しています。

(Application No.) (出願番号)	(Filing Date) (出願日)
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(Application No.) (出願番号)	(Filing Date) (出願日)
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私は、私自信の知識に基づいて本宣言書中で私が行なう表明が真実であり、かつ私の入手した情報と私の信じているところに基づく表明が全て真実であると信じていること、さらに故意になされた虚偽の表明及びそれと同等の行為は米国法典第18編第1001条に基づき、罰金または拘禁、もしくはその両方により処罰されること、そしてそのような故意による虚偽の声明を行なえば、出願した、又は既に許可された特許の有効性が失われることを認識し、よってここに上記のごとく宣誓を致します。

I hereby claim foreign priority under Title 35, United States Code, Section 119 (a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or Section 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

Priority Claimed  
優先権主張

<input type="checkbox"/> Yes はい	<input type="checkbox"/> No いいえ
<input type="checkbox"/> Yes はい	<input type="checkbox"/> No いいえ

I hereby claim the benefit under Title 35, United States Code, Section 119(e) of any United States provisional application(s) listed below.

(Application No.) (出願番号)	(Filing Date) (出願日)
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I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s), or Section 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code Section 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of application.

(Status: Patented, Pending, Abandoned) (現況: 特許許可済、係属中、放棄済)
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(Status: Patented, Pending, Abandoned) (現況: 特許許可済、係属中、放棄済)
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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.



## Japanese Language Declaration

(日本語宣言書)

委任状：私は下記の発明者として、本出願に関する一切の手続きを米特許商標局に対して遂行する弁理士または代理人として、下記の者を指名いたします。  
(弁理士、または代理人の指名及び登録番号を明記のこと)

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith: (list name and registration number)



022850

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第二の共同発明者の署名	日付	Second joint Inventor's signature Date
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国籍	Citizenship	
郵便の宛先	Post Office Address	

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(Supply similar information and signature for third and subsequent joint inventors.)